

REMARKS

Claims 1-19 are now pending.

Claims 1-5, 12, and 16 have been rejected under 35 U.S.C. Section 102(b) as being anticipated by GB2,266,366A. Claims 13 and 14 have been rejected under 35 U.S.C. Section 103(a) as being unpatentable over GB2,266,366A. Claim 15 has been rejected under 35 U.S.C. Section 103(a) as being unpatentable over GB2,266,366A in view of JP08-227522. Claim 18 has been rejected under 35 U.S.C. Section 102(e) as being anticipated by 2002/0093723. Claim 19 has been rejected under 35 U.S.C. Section 102(e) as being anticipated by 2003/0053742. Claims 6-11, and 17 have been objected to as being dependent upon the rejected base claims, but would be allowable by being rewritten in independent form to include all of the limitations of the base claims and any intervening claims.

The Applicant has amended the present application so as to be in condition for allowance in the next Office Action.

Amended Claim 1 is believed to be patentable over GB2,266,366A. Amended Claim 1 is directed to an angle detection optical system that is included in the angle detection optical apparatus that had been claimed by the original Claim 1. Further, the amended Claim 1 includes first and second limitations that differentiate the claimed invention from the above citation. The first limitation is that "an optical path splitting element that splits reflected light that has been reflected by the reflective surface for detection into first and second luminous fluxes that are respectively propagated on at least first and second optical paths that are different from each other." The second limitation is that "a first optical detector that is placed on the first optical path so as to receive the first luminous flux and a second optical detector that is distanced from the first optical detector and placed on the second optical path so as to receive the second luminous flux." Examples of the "optical path splitting element" and "first and second optical detectors" are "optical path splitting surface 4b" and "light receivers 10A and 10B", respectively, which are

disclosed in the drawings of FIGS. 2, 5-8 and described in the embodiments with reference to those drawings. The above described first and second limitations are supported by the specification and drawings.

Further, Claim 1 has been amended to delete another limitation “that detects an inclination angle of a detection object” from the “preamble” thereof.

GB2,266,366A discloses that reflected light that has been reflected by a reflective surface for detection (FIG. 1, Ref. 13) is further reflected by an optical path splitting element (FIG. 1, Ref. 7) so that the reflected light is propagated toward the optical detector (FIG. 1, Ref. 11). The optical path splitting element (FIG. 1, Ref. 7) splits the light from the light source (FIG. 1, Ref. 1) into a luminous flux that is propagated to the reflective surface for detection (FIG. 1, Ref. 13) and another luminous flux that is propagated to an internal reference mirror (FIG. 1, Ref. 9). Further, the optical path splitting element (FIG. 1, Ref. 7) ensures that both a reflected luminous flux reflected by the reflective surface for detection (FIG. 1, Ref. 13) and another reflected luminous flux reflected by the internal reference mirror (FIG. 1, Ref. 9) are propagated through a single optical path toward a single optical detector array (FIG. 1, Ref. 11) that is placed on the single optical path.

Accordingly, the “optical path splitting element” recited in the amended Claim 1 is quite different from the optical path splitting element (FIG. 1, Ref. 7) disclosed in GB2,266,366A.

Further, GB2,266,366A merely discloses a single optical detector array (FIG. 1, Ref. 11) that is placed on the single optical path, but does not disclose or teach the above-described second limitation of amended Claim 1.

Accordingly, the combination of the “first optical detector” and the “second optical detector” recited in amended Claim 1 is quite different from the single optical detector array (FIG. 1, Ref. 11) disclosed in GB2,266,366A.

Therefore, amended Claim 1 is not disclosed in or taught by GB2,266,366A and is allowable.

Claim 2 has been amended to conform with amended Claim 1. Amended Claim 2 is believed to be further patentable over GB2,266,366A. Amended Claim 2 defines that “a first

amount of movement of the first luminous flux on a first light receiving surface of the first optical detector is different from a second amount of movement of the second luminous flux on a second light receiving surface of the second optical detector, and the first and second amounts of movement are caused by a variation in the inclination angle of the detection object.” Thus, the limitations of amended Claim 2 are not disclosed in or suggested by GB2,266,366A. Amended Claim 2 is supported by page 23, lines 8-12 of the specification.

The Examiner misinterpreted GB2,266,366A when he stated on page 3, lines 1-2 of the Office Action that the element 7 (FIG. 1, Ref. 7) is a reflective surface for detection. The element 7 is the reflective light path splitting element, but not the reflective surface.

Claim 3 has been amended to conform with the amended Claim 1 on which it depends. Amended Claim 3 is believed to be further patentable over GB2,266,366A. Amended Claim 3 defines that “a first length of the first optical path that is defined between the reflective surface for detection and a first light receiving surface of the first optical detector is different from a second length of the second optical path that is defined between the reflective surface for detection and a second light receiving surface of the second optical detector.” The limitations of amended Claim 3 are not disclosed or suggested by GB2,266,366A. Amended Claim 3 is supported by page 20, line 22 through page 21, line 1 of the specification.

Claim 4 has been amended to conform with amended Claim 1 on which it depends. Amended Claim 4 is believed to be patentable over GB2,266,366A. Amended Claim 4 defines that “the first and second optical detectors are different from each other in characteristic of angle detection sensitivity.” Amended Claim 4 is supported by page 33, lines 4-5 of the specification. Thus, the limitations of amended Claim 4 are not disclosed or suggested by GB2,266,366A.

Claim 5 has been amended to conform with amended Claim 1 on which it depends. Amended Claim 5 defines that “the optical path splitting element comprises a beam splitter with an optical path splitting surface that splits the reflected light into the first and second luminous flexes.” Amended Claim 5 is supported by page 15, line 25 through page 16, line 1 of the specification.

Claim 6 has been amended to conform with amended Claim 1 on which it depends. Amended Claim 6 defines that “the angle detection apparatus further comprises: at least one

optical surface with an optical power that is placed between the optical path splitting element and at least one of the first and second optical detectors.” Amended Claim 6 is supported by page 22, lines 10-14 of the specification.

Claim 7 has been amended to define that “the at least one optical surface is provided integrally to the at least one of the first and second optical detectors.” Amended Claim 7 is supported by page 26, lines 6-12 of the specification.

Claim 8 has been amended to conform with amended Claim 6 on which it depends. Amended Claim 8 defines that “the at least one optical surface comprises first and second optical surfaces that are different in optical power from each other and are respectively placed on the first and second optical paths.” Amended Claim 8 is supported by page 22, line 25 through page 23, line 3 of the specification.

Claim 9 has been amended to conform with amended Claim 1 on which it depends. Amended Claim 9 defines that “the at least one optical surface has a positive optical power.” Amended Claim 9 is supported by page 22, lines 10-14 of the specification.

Claim 10 has been amended to depend upon and conform with amended Claim 1 on which it depends. Amended Claim 10 defines that “the at least one optical surface comprises a reflective surface that has a positive optical power.” Amended Claim 10 is supported by page 29, line 7 of the specification.

Claim 11 has been amended to depend upon and conform with amended Claim 1 on which it depends. Amended Claim 11 defines that “the optical path splitting element comprises a polarization splitting surface that either transmits or reflects the light by a polarization component, and the angle detection apparatus further comprises: a $1/4$ wavelength plate that is placed between the polarization splitting surface and the at least one optical surface.” Amended Claim 11 is supported by page 28, lines 11-12 of the specification.

Claim 12 has been canceled.

Claims 13-16 have been amended to merely conform with amended Claim 1.

Claim 17 has been amended to define an angle detection apparatus that includes the angle detection optical system of amended Claim 1 and a signal processor that cooperates with the angle detection optical system so as to generate an angle detection signal that corresponds to

a magnitude of an inclination angle of the detection object. Claim 17 is believed to be patentable over GB2,266,366A for the same reasons mentioned in connection with amended Claim 1. An example of the "signal processor" is "a signal processing section 60b", which is disclosed in the drawing of FIG. 1 and described in the embodiment with reference to the drawing. The "signal processor" is supported by the specification and drawings.

Further, GB2,266,366A mentions on page 9, line 23, that the alignment of the external measurement mirror (FIG. 1, Ref. 13) is measured. The alignment to be measured is related to a displacement of the external measurement mirror (FIG. 1, Ref. 13) along the axis of optical path, which is marked by an arrow in FIG. 1. GB2,266,366A discloses an angle detector that detects the angle of a beam, which depends on an inclination of the internal reference mirror (FIG. 1, Ref. 9). The internal reference mirror (FIG. 1, Ref. 9) is not the detection object to be measured. Thus, GB2,266,366A does not disclose or teach the signal processor that generates an angle detection signal that corresponds to a magnitude of an inclination angle of the detection object.

Accordingly, a "signal processor that generates an angle detection signal that corresponds to a magnitude of an inclination angle of the detection object" is not disclosed in or taught by GB2,266,366A.

Claim 18 has been amended to incorporate and recite all of the limitations of amended Claim 17.

Claim 19 has been amended to incorporate and recite all of the limitations of amended Claim 17.

It is believed that all of the reasons for the rejection and objections have been overcome by the amendments. Reconsideration and allowance of the present application is respectfully requested.

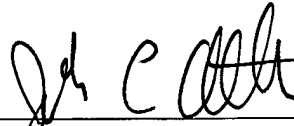
The Examiner is invited to call the undersigned at (202) 220-4200 to discuss any information concerning this application.

Appl. No. 10/743,725
Amdt. dated February 27, 2006
Reply to Office Action of November 30, 2005

The Office is hereby authorized to charge any additional fees under 37 C.F.R. § 1.16 or § 1.17 or credit any overpayment to Deposit Account No. 11-0600.

Respectfully submitted,

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